

**ISTAT APPRAISERS' PROGRAM
(IAP)**

and

**ISTAT APPRAISERS' PROGRAM
INTERNATIONAL BOARD OF GOVERNORS
(IBG)**

International Society of Transport Aircraft Trading



by

ISTAT Appraisers' Program International Board of Governors

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Unless specifically indicated otherwise, references herein to various groups, persons and titles should be considered to have the following meanings:

Administrative Director - The Administrative Director of the ISTAT Appraisers' Program

Chairman - The Chairman of the ISTAT Appraisers' Program

Chairman-elect - The elected successor to the incumbent Chairman

Directors - Members of the ISTAT Board of Directors

Executive Director - The Executive Director of the ISTAT headquarters staff

IBG - The ISTAT Appraisers' Program International Board of Governors

President, Vice President - The President and Vice President of ISTAT

Program - The ISTAT Appraisers' Program (IAP)

Society - ISTAT (International Society of Transport Aircraft Trading)

ISTAT APPRAISERS' PROGRAM

A. Program Overview

- 1) The International Society of Transport Aircraft Trading (ISTAT) is a non-profit society whose members have common interests in the manufacture, purchase, brokerage, leasing, maintenance and appraisal of transport aircraft. International in structure, it is self-supporting and unaffiliated. Within ISTAT is a core group of professional aircraft appraisers who work cooperatively for the elevation of the appraisal profession within the world aviation community.
- 2) Each ISTAT member, who has satisfactorily demonstrated that he/she is qualified to appraise airline transport aircraft, has been granted the right to use one of the professional designations established by ISTAT. The use of such designations is predicated upon Society criteria: written examinations, submission of representative appraisal reports, full-time valuation experience, personal background check and participation in the Society's program of ongoing education.
- 3) Ethical practices and conduct required of the appraisers accredited by the Society are clearly defined in the ISTAT publication, *Principles of Appraisal Practice and Code of Ethics*.

B. Professional Appraiser Categories

- 1) The ISTAT Appraisers' Program has established four professional status categories:
 - Appraiser
 - Senior Appraiser
 - Appraiser Fellow
 - Appraiser Emeritus
- 2) These professional status categories are awarded to individuals, not to corporations or other business organizations. Only Senior Appraisers may use the designation "ISTAT" after their names. An Appraiser Fellow may use the designation "FISTAT." The category of "Candidate" is established to formalize the status of applicants wishing to join the program.

- 3) The primary prerequisites for attaining the foregoing professional designations are:

a) Education

A Bachelor's degree or higher degree from a recognized institution of learning or such other education, knowledge or experience as may be deemed to be the equivalent of such professional education by the ISTAT Appraisers' Program. This higher education prerequisite should recognize aviation content as being highly desirable, carrying significant weight for consideration of an application to enter the program as a Candidate.

b) Experience

“**Appraiser**” status requires a minimum of five years employed full time in aviation-related business, of which no less than two years shall have been spent in accomplishing aircraft appraisals.

“**Senior Appraiser**” status requires a minimum of seven years employed full-time in aviation-related business, of which no less than six years shall be spent in accomplishing aircraft appraisals.

“**Appraiser Fellow**” is an honorary designation, and may be bestowed by the Appraisers’ International Board of Governors (IBG) on a Senior Appraiser who has rendered outstanding service to the appraisal profession and the Society.

“**Appraiser Emeritus**” is an honorary designation, bestowed by the IBG on a Senior Appraiser, or Appraiser Fellow, for outstanding service to the Appraisers’ Program and the Society. The designation is not contingent upon remaining a member of ISTAT if the member is retired, incapacitated or deceased.

c) Examinations

In order to achieve Appraiser or Senior Appraiser status through the ISTAT Appraisers’ Program, the individual, in addition to other mandatory requirements, must pass a set of comprehensive examinations covering areas of general valuation theory, technical expertise and professional ethics. The scope of the examinations will be found in Sub-section F below. After advancing to the professional status of “Appraiser”, the individual may sit for examination to advance to the professional status of “Senior Appraiser” no less than two years later.

d) Appraisal Reports

Candidates for a professional designation must submit samples of full appraisal reports, including reports for aircraft physical inspection and maintenance documentation inspection actually accomplished by the Candidate, for evaluation and review as part of the professional designation process. See the section *Types of Appraisals* for the definition of a full appraisal.

e) Personal Investigation & Sponsorship

Each individual seeking ISTAT admission as a Candidate must furnish professional and personal references and be subject to background investigations. A sponsor must sign the application form and be an ISTAT Certified Appraiser with at least two years certification seniority or a Certified Senior Appraiser. The sponsor should consider an aeronautical education and hands-on experience in the aviation industry as highly positive factors in supporting a prospective appraiser Candidate. The sponsor should verify the Candidate’s work history, and have knowledge of his/her current appraisal activities. The Appraisers’ International Board of

Governors and Administrative Director will heavily weight these factors in considering the qualifications of a prospective Candidate.

C. Appraiser Candidates

- 1) Appraisers and persons engaged in the appraisal profession may apply to join the program at the Candidate level. They may then participate in the program activities such as educational programs, seminars and other activities for a period of three years, during which time they have to meet the qualifying criteria and take the examinations. In the event they are not successful in passing the exams during this time, they may renew their participation in the program for two more years upon payment of a second entry fee in order to take the exams (see Sub-section E below). Therefore the maximum length of time a Candidate can remain continuously in the program is five years.
- 2) Candidates shall be of legal age, of good character, interested in the activities and objectives of the Society and its transport aircraft appraisal program, and shall have established business experience in their communities.
- 3) Candidates are not professionally designated and may not use the ISTAT professional designations. Candidate memberships are personal and cannot be transferred, nor applied to business organizations.

D. Mandatory Continuing Education Program

- 1) To assure that competent, relevant, current valuation counsel will be available to the industry, the ISTAT Appraisers' Program requires that all Candidates and ISTAT-certified professional appraisers participate in the Program's continuing education sessions.
- 2) The continuing education program will primarily be comprised of seminars to be held in conjunction with the annual ISTAT Americas conference. Ideally, ISTAT appraisers should attend every seminar. In order to retain accredited status, a Candidate or ISTAT-certified appraiser may not be absent from more than two consecutive annual seminars.
- 3) In extraordinary circumstances the IBG will consider allowing additional absence following a written explanation from the candidate/appraiser. The IBG will consider the request for reinstatement taking into account the written explanation and will have the option of upholding the discontinuance of membership in the program, restoring the accredited status, or placing the member into an "inactive/suspended " category until the member attends the next available continuing education session.

E. Applications to Enroll and Advance in the Appraisers' Program

- 1) Initial entry into the ISTAT Appraisers' Program begins with the application for entry at the Candidate level. Applicants must be paid-up members of ISTAT and submit the application form co-signed by the sponsor together with the entry fee. A Candidate's participation in the program is limited as follows:

- A Candidate's enrollment will be limited to an initial period of three years during which time period he must arrange with the ISTAT Appraisers' Program Administrator to sit for the written examinations and successfully attain the status of Appraiser.
 - Should a Candidate be unsuccessful in passing the examinations within a time frame roughly approximating the three-year time limit, and if approved by the ISTAT Appraisers' Program Administrator, the Candidate shall be required to re-apply for testing and pay another application fee, upon which he/she will be granted one additional period approximating two years during which time the Candidate must achieve Appraiser certification.
 - Should a Candidate fail to achieve Appraiser certification after the additional two-year extension period, he/she shall be barred from re-applying to the program for admission and testing. The only waiver to this provision may be granted by the ISTAT Appraisers' Program International Board of Governors after reviewing any application for relief and agreeing to grant same following an affirmative vote of the majority of the Board.
- 2) Candidates may apply for advancement to the professional status of Appraiser for which they must take the qualifying Ethics, Technical, Appraisal and Finance examinations, and have accrued a minimum of five years professional experience in aviation activities at the time of completing and passing the examinations. Before a Candidate may apply to take the examinations for advancement in grade, the Candidate must have attended at least one annual ISTAT business meeting and continuing education session, or have been enrolled as a Candidate for at least 12 months prior to the examination date. The Candidate must submit the application for advancement and other qualifying material listed below at least 90 days prior to the annual examination, which will usually be offered during the ISTAT Americas annual Conference. This allows a period of 60 days for ISTAT to review the application material, to examine the samples of appraisal work, and to provide any appropriate feedback or guidance to the Candidate.
 - 3) After the period of no more than 60 days the Candidate will be notified whether he/she is qualified to take the examination. If the application is denied, ISTAT will describe the shortcomings of the application package and, if possible, an opportunity will be provided for the Candidate to remedy the deficiencies in time to take the examinations.
 - 4) With regard to the minimum experience requirements, the Society recognizes that a Candidate may have been engaged in more diverse activities than solely appraisals. The minimum requirements may be satisfied on a pro-rata basis such that, for example, two years of employment during which appraisals constituted approximately one-half of the activity may be construed as the equivalent of one year of full-time experience. A maximum of five years of part-time appraisal work can be used for totaling the two years of full-time experience. When a Candidate has been admitted to the Program without the full two years of appraisal experience, page three of the original application form must be updated and resubmitted when applying for advancement in grade. Page three details the appraisals a Candidate has undertaken so that it can be determined if the experience requirements have been met.

- 5) Certified Appraisers may apply for advancement to the professional grade of Senior Appraiser for which they must take the qualifying Technical examination no less than two years after attaining Appraiser grade (minimum of seven years professional experience required at the time of completing and passing the Technical examination).
- 6) Application forms for enrolling in the ISTAT Appraisers' Program, for advancing in grade, and for taking the qualification examinations may be downloaded from the ISTAT website, then forwarded either electronically or by mail to the program's Administrative Director for review and processing.
 - The application for initial enrollment as a Candidate requires a signature by a sponsor, a work history, and a summary of appraisal experience and a list of persons who may be contacted for references. Applicants who are accepted into the program will enroll at the Candidate level.
 - The application by Candidates wishing to advance to Appraiser grade must include updated information on work history and appraisal experience showing that the minimum experience levels have been satisfied, plus two sample appraisal reports. When the application has been reviewed and approved, the Candidate may then apply to take the four qualifying examinations.
 - The application by certified Appraisers wishing to advance to Senior Appraiser grade requires only updates of the work history and appraisal experience. When the application has been reviewed and approved, the Appraiser may then apply to take the qualifying examination.

F. Description of Appraisers' Examinations

1) General

ISTAT provides laptop computers with Microsoft Word and Excel installed for the Candidates to use. A Candidate who is more comfortable using his/her own keyboard, and if it has a USB connector, may be able to use it (no guarantee).

The exams will be graded by the two Senior Appraisers then currently serving on the program's International Board of Governors. To avoid any possible bias in the grading process, each Candidate will be assigned a fictitious name or code letter.

The exams include no true/false or multiple-choice answers. Some may be answered in a few words, but most will ask for an explanation of the answer or an explanation of the concept in question, so a complete answer could include two or three paragraphs. Each question will be graded on the answer itself as well as the Candidate's ability to express issues clearly. The passing grade on each exam is 80% -- a high standard as expected of someone hoping to be certified as an expert in the field.

2) The Ethics and Methodology Exam

This examination, administered to Candidates wishing to advance to Appraiser status, will be based primarily on the subject matter in the *ISTAT Principles of Appraisal Practice*

and Code of Ethics. The Candidate must show an appreciation of the issues in question and an ability to articulate clearly and logically on such matters. Some questions may pose a scenario with potential ethical issues and ask how they should be resolved. As in the real world, some scenarios may have ambiguous ethical dimensions, requiring an appreciation of both sides of the relevant issues.

3) The Appraisal Exam

Candidates will be required to compose an aircraft appraisal report as though it has been requested in the real world on short notice. They may be given a brief summary of the key findings of an inspection report that includes the aircraft specifications and the maintenance status of the airframe and engines. They may also be provided with various market-related data similar to what they would normally have available in their own files, such as orders and delivery information for the aircraft type in question, numbers in storage, numbers for sale, recent transactions of comparable aircraft and the like.

Since an appraiser would normally have a previous report available when composing a new report, Candidates will be given a list of the essential elements to be included in any appraisal report, based mainly on Section 8 of the *Principles of Appraisal Practice and Code of Ethics*. The report need not be in a particular format, but it must include all of those essential elements in a logical, easy-to-read fashion.

Candidates should expect to make various value calculations with respect to the aircraft specification, maintenance status data and the engine “disk tables.” A working knowledge of Microsoft Excel is expected for various calculations. Candidates will be expected to explain how they arrived at their conclusions in enough detail so that if another appraiser were asked to review their work he/she would be able to follow the methodology procedure and understand how the value opinions were derived.

The Appraisal Exam is graded partly on the inclusion of all of the essential elements, partly on the arithmetical calculations, and partly on a Candidate’s ability to present the information clearly. Even though the graders are Senior Appraisers, they will consider how well the appraisal report can be read and understood by non-experts like financiers, investors and lawyers.

4) The Finance Exam

The Finance Exam was formerly part of the Appraisal exam, asking the Candidate to do certain basic present-value calculations related to a lease attached to a subject aircraft. It is now a separate exam so that any shortcomings here would not necessarily require the Candidate to retake the entire Appraisal exam once more. Candidates will be expected to calculate such things as net present value from a stream of lease payments, or calculate the rate of return for an income stream. Excel includes certain built-in financial functions that can be used, so Candidates should come prepared to use those functions. Alternatively, they may do the calculations from basic principles. A hand-held calculator may not be used because it will be impossible for the graders to see how the calculations were performed.

The grading of the Finance Exam will be based partly on knowing the definitions of the financial terms involved, partly on explaining the methodology being used, and partly on arriving at the correct numerical results.

5) The Technical and Senior Technical Exams

The Technical examinations for Candidates and Appraisers wishing to advance in grade are intended to reveal the examinee's understanding of various technical terms and techniques that form part of the aircraft appraisal profession. Questions may relate to regulations such as those issued by national aviation authorities. A detailed knowledge of individual regulations is not necessarily required, but the examinee is expected to have a general understanding of those most relevant to aircraft valuation. Some questions may deal with definitions of various types of values as set out in this handbook, or other technical or financial terms such as those contained in the Glossary section. The examinee may be asked to interpret extracts from aircraft maintenance records, such as engine "disk tables" and airframe maintenance programs and explain the effects of various technical factors on aircraft values.

The Senior Technical Exam may include all of the topics described above for the Technical Exam, but the questions may be more difficult and/or be graded more strictly. The Senior Exam may also include "refresher" questions related to ethics and financial issues.

Again, the Technical and Senior Technical Exams will be graded partly on the examinee's knowledge of the subjects and partly on the ability to explain the issues and concepts in a way that is understandable by non-experts. A good indicator of one's grasp of a subject is the ability to explain it to someone who does not already have that knowledge.

G. Administrative Director

- 1) The position of Administrative Director has been established to provide continuity and support to the ISTAT Appraisers' Program. The Administrative Director is chosen by the ISTAT Board of Directors upon recommendation by the Chairman of the program's International Board of Governors (IBG), who will review the suitability of candidates for the position. While there are no strict qualifications required, ideally the Administrative Director should have been a Senior Appraiser or Fellow, preferably retired from full-time appraisal activity and having previously served on the IBG, who is able to devote the necessary time to the appraiser program. He receives a salary plus reimbursement for reasonable expenses incurred in furtherance of the program, and serves for no fixed term of office.
- 2) The Administrative Director provides administrative support and assistance to the Chairman of the ISTAT Appraisers' Program, and similarly assists the Executive Director of the ISTAT headquarters staff. His specific responsibilities include:
 - Respond to requests for information regarding the ISTAT Appraisers' Program.

- Review all applications to join the program, including personally checking listed references by the applicant and sponsor. Where necessary, request the appraiser and/or the non-appraiser members of the IBG to assist in following up the references.
- Review all applications for advancement in grade from Candidate to Appraiser for qualifications and coordinate the review of the Candidate's sample appraisal reports with the appraiser members of the IBG. Also review all applications for advancement in grade from Appraiser to Senior Appraiser in coordination with the Chairman and Senior Appraisers on the IBG.
- In conjunction with the IBG Chairman, compose examination questions; arrange, administer and proctor the annual examinations for appraisers who have applied for advancement in grade.
- The two Senior Appraiser members of the IBG are responsible for grading the examination papers. To ensure consistency in marking, the two appraisers will independently from each other, grade all of the papers in each exam subject. i.e. Technical, Ethics, Financial or Appraisal. The Administrative Director will coordinate the process, and act as an arbiter in any disputes from the grades given after grading the disputed paper himself. Review all graded papers for fairness and correct allocation of marks to each answered question.
- Prepare and send the certificates to successful examinees.
- In concert with the IBG Chairman, obtain speakers and organize the continuing education seminar and appraisers' business meeting held during the ISTAT Americas Conference.
- In conjunction with the IBG Chairman, revise and distribute the Appraisers' Program handbook as necessary.
- Reproduce and distribute notices and letters by the Chairman to the participants in the Appraisers' Program.
- Maintain current the dossier on the participants in the program, including professional grades attained, services on the International Board of Governors, and attendance at the mandatory continuing education seminars, changes in employment and change of addresses.
- Organize and arrange to have manned appraisers' exhibit tables at the ISTAT events and conferences as directed.
- Maintain complete records of the Appraisers' Program and store identified archives in a secure area that can be accessed by other persons qualified to do so in the event that the Administrative Director is incapacitated. Reasonable notice must be given to the Administrative Director's spouse, executor, or such person the Administrative Director may have nominated, for access or removal of the archives to another location.
- Write and get printed, brochures and the appraisers' directory for the exhibit stand.
- Maintain complete records of the Appraisers' Program and ensure that critical files be stored at ISTAT HQ.

- As requested by the IBG Chairman, prepare reports for ISTAT Board Meetings (January, March, June and October.
- Coordinate appraisals for all issues of Jetrader and ensure they are provided in a timely manner.

APPRAISERS' PROGRAM INTERNATIONAL BOARD OF GOVERNORS

A. Functions & Responsibilities

- 1) On March 8, 1989, after conducting a six-year development program, the ISTAT Board of Directors officially instituted the ISTAT Appraisers' Program (IAP) and its governing body, the International Board of Governors (IBG). The IBG has the responsibility to administer, oversee, modify standards and procedures of appraisal practice and the Code of Ethics, and govern the ISTAT Appraisers' Program. It also has the responsibility of hearing, reviewing and ruling upon any disciplinary action which may have to be taken should a certified ISTAT appraiser be brought before the board for allegedly violating the rules, Code of Ethics or established appraisal practice standards and procedures.

B. Membership in the International Board of Governors

- 1) The IBG shall be comprised of three certified ISTAT Senior or Fellow Appraisers (including the Chairman) plus five additional members of ISTAT representing other interests such as leasing companies, banks, airlines, manufacturers, aircraft repair agencies, and aircraft brokers.
- 2) The Chairman must hold current ISTAT Senior Appraiser or Fellow status and have a minimum of ten years' professional experience in the commercial aviation industry.

C. Election of IBG Chairman, Chairman-Elect and Members, Terms of Office

- 1) The Chairman of the International Board of Governors shall serve for a period of three years. At the conclusion of the second year of this three-year term, a Chairman-Elect shall be selected as a successor to the incumbent Chairman. The term of the Chairman-Elect shall overlap the third year of the incumbent Chairman's term, followed by a three-year term as Chairman. An incumbent Chairman may serve one additional consecutive term, but he must be nominated and elected to do so one year prior to completing his first term.
- 2) Beginning one month preceding the annual ISTAT Americas conference, nominations for Chairman-Elect and/or IBG Appraiser Members may be submitted in writing to the current Chairman. Nominees must be ISTAT members and have agreed to be nominated. Nominations may be presented by any Candidate, Appraiser, Senior Appraiser, or current member of the International Board of Governors, and may be presented as late as prior to the start of the annual Appraisers' Program business meeting, which is usually held before the annual ISTAT Americas conference. Voting will be by secret ballot during the appraisers' continuing education seminar held at the conference, with votes being cast by Appraisers, Senior Appraisers and members of the IBG who are present at the seminar. No write-in or absentee ballots may be cast. Votes will be tallied immediately by two persons designated by the Chairman, and the results will be announced at that time.

- 3) The two Appraiser members of the International Board of Governors shall serve two-year terms with their terms staggered. These two appraisers have the additional responsibility of reviewing and grading the examinations of those applicants who have taken the ISTAT Appraisers' certification examinations, and the staggering of terms assures continuity in the grading process.
- 4) In accordance with the ISTAT by-laws, the five non-appraiser members of the IBG are elected by the ISTAT Board of Directors from candidates of their choosing. Likewise, their two year terms are also staggered, with two replacements elected one year and three the following year. The Program Administrator shall coordinate the process with the ISTAT Board and the Program Chairman.

D. Confidentiality

- 1) Any details of a case against, or the circumstances regarding, any ISTAT appraiser(s) (including the appraiser's name) that may be brought before the IBG for review/or possible disciplinary action, shall be kept confidential by the IBG. The very knowledge of such review must remain completely confidential to the IBG, and the reputations of the ISTAT appraisers strictly guarded during the process. Whatever action the IBG elects to take must remain private to the Board and is not to be released to anyone outside the IBG.

E. International Board of Governors Actions

- 1) Should the International Board of Governors recommend disciplinary action, the recommendation will be presented to the Board of Directors of ISTAT who shall then take whatever action deemed appropriate. It will be the ISTAT Board's responsibility to make such actions public and publish the results of such action in the ISTAT newsletter and/or elsewhere as they deem appropriate.

F. No Liability

- 1) As a prerequisite to becoming certified as an ISTAT Appraiser or Senior Appraiser, the applicant, in signing the application, certifies that he/she releases the ISTAT Board of Directors and the ISTAT Appraisers' Program International Board of Governors from any liability in their conduct and operation of the appraisal program.

G. Resolution of Disputes

- 1) The ISTAT Appraisers' Program and the Program membership will provide a mechanism for hearing complaints lodged against any active participant in the Program with respect to that participant's activities as an appraiser. Such complaints should be presented in writing to the Chairman of the International Board of Governors. The written complaint must include acknowledgment that the Chairman

and any other parties called upon by the Chairman to assist in the resolution of the matter will not be held liable for any actions they may take with respect to the complaint. If the original complaint does not include these assurances, the Chairman will request that they be provided before he proceeds further with any investigation or disciplinary action.

- 2) Upon receiving a complaint, the Chairman may consider attempting to resolve the problem through his own good offices, such as sending a cautionary letter to the member against whom the complaint has been lodged. The Chairman may use his discretion whether to identify the complaining party.
- 3) If the Chairman deems the complaint to be of sufficient gravity, he may convene a "Dispute Resolution Committee" comprised of three members of the ISTAT Appraisers' Program, made up of the current Chairman, current Administrative Director, and any active past Chairman.
- 4) In the event of a conflict or a complaint directed toward the Administrative Director or current or past Chairman, a third member participant shall be selected from the active Senior Appraisers then serving on the International Board of Governors to hear the complaint; said Senior Appraiser shall be selected by agreement between the two non-conflicted parties remaining on the Dispute Resolution Committee.
- 5) The Dispute Resolution Committee shall hear complaints directed toward Program members and Candidates involving:
 - Ethics violations
 - Material commercial incompetence (the inability to render a meaningful appraisal product),
 - Improper business practices,
 - Other matters of a significant nature which may come before the Committee.
- 6) As part of their investigative process, the Dispute Resolution Committee may call upon the Member against whom the complaint has been lodged, and that Member will cooperate with the Committee in answering questions or explaining circumstances that may be relevant. Failure of the Member to respond in a timely matter may be interpreted by the Committee as admission that the complaint is well founded.
- 7) Upon completing their investigation, the Dispute Resolution Committee may recommend actions such as the following:
 - The dispute under scrutiny requires no action,
 - A letter of censure or reprimand from the Chairman of the International Board of Governors with a cease and desist recommendation,
 - Withdrawal of the ISTAT Appraiser's Certification, or in the case of a Candidate Appraiser, termination of the Candidate's participation in the ISTAT Appraisers' Program.

- 8) Upon unanimous agreement of the Dispute Resolution Committee, the above recommended action(s), if any, shall be submitted to the Program's International Board of Governors for a vote. If the IBG shall agree in the majority, the recommendations shall be forwarded to the ISTAT Board of Directors for their consideration. Should the IBG not agree by a majority vote, then the recommended action shall be terminated and the matter concluded.
- 9) Should the Dispute Resolution Committee and the International Board of Governors both agree upon the recommendation of an act to remove an Appraiser's certification or a Candidate's membership, then the action shall be submitted to the ISTAT Board of Directors for their advice and consent.
- 10) In keeping with the confidentiality required of any deliberations by the International Board of Governors, the nature of the complaint, the Dispute Resolution Committee's recommendations, and the final action taken will not be made public or discussed with the membership without prior consent by the ISTAT Board of Directors.

TYPES OF APPRAISALS

DESKTOP APPRAISAL

A desktop appraisal is one which does not include any inspection of the aircraft or review of its maintenance records. It is based upon assumed aircraft condition and maintenance status or information provided to the appraiser or from the appraiser's own database. A desktop appraisal would normally provide a value for a mid-time, mid-life aircraft.

EXTENDED DESKTOP APPRAISAL

An extended desktop appraisal is one which is still characterized by the absence of any on-site inspection of the aircraft or its maintenance records, but does include consideration of maintenance status information that is provided to the appraiser from the client, aircraft operator, or in the case of a second opinion, possibly from another appraiser's report. An extended desktop appraisal would normally provide a value that includes adjustments from the mid-time, mid-life baseline to account for the actual maintenance status of the aircraft.

FULL APPRAISAL

A full appraisal is one that includes an inspection of the aircraft and its maintenance records. This inspection is aimed solely at determining the overall condition of the aircraft and records to support the value opinions of the appraiser, and would not, for example, include opening of inspection panels on the aircraft or a detailed review of record archives. A full appraisal would normally provide a value that includes adjustments from the mid-time, mid-life baseline to account for the actual maintenance status of the aircraft, and possibly other adjustments to reflect the findings of the inspection of the aircraft and its records.

COMPREHENSIVE APPRAISAL

A comprehensive appraisal is one that includes a detailed inspection of the aircraft and records. Sufficient detail is required, for example, to insure that the records are in sufficiently good order to allow for the re-registration of the aircraft in a different country.

FINANCIAL APPRAISAL

A financial appraisal is one that determines the value of an aircraft to an investor based upon the income earning potential from its lease and residual value. A financial appraisal may be done in conjunction with either desktop or full appraisals.

NOTE: Regardless of the type of appraisal being performed, the appraiser should clearly state to his client the type of appraisal, the principal assumptions in the analysis, and the sources of information upon which the appraisal is based.

VALUE DEFINITIONS

Preamble

- 1) Almost every trade or profession has evolved a vocabulary of its own in which words and phrases that may also be in common everyday use by laymen are endowed with special meaning within the profession. An engineer, for example, might refer to the *strain* experienced by a structural member, and his colleagues will know that he is describing the amount of its distortion or elongation, and he may also refer to the *load* carried by the member, or the *stress* within the material. The distinctions are clear to his colleagues, in fact such precision of language is essential to their understanding, but many laymen would fail to appreciate the distinctions among stress, strain and load.
- 2) Likewise, the vocabulary of aircraft appraisers may be generally well understood within the profession, but appraisal reports are almost invariably prepared for non-appraisers and may be read by accountants, financiers, lawyers, tax authorities, judges, investors and juries of laymen. Thus it is incumbent on the appraiser to fully understand the vocabulary of appraising, and at the same time to set forth in his written reports the meanings of various terms so that his opinions are neither misapplied nor misunderstood by the users of the reports.
- 3) Normally an appraisal is concerned with the determination of a *value*. Below are definitions of some of the types of values that appraisers are most commonly asked to determine. Elsewhere in this volume are glossaries of additional technical and financial terms frequently used in appraisals.
- 4) Unique circumstances may demand specific definitions not found below. The definitions offered here provide the fundamental concepts and are not the only acceptable definitions, since contracts for some aircraft sales and leases may dictate a somewhat different notion through definitions of their own. *To the maximum extent possible, appraiser's use of these terms should conform to those the ISTAT guidelines. Where the circumstances of a particular appraisal assignment dictate a departure from these guidelines (such as an appraisal in connection with a lease or purchase contract that contains its own definitions), the appraiser's report should clearly state the definitions attached to such terms to preclude any possibility that they could be misconstrued as conforming to the ISTAT guidelines.*

Base Value is the Appraiser's opinion of the underlying economic value of an aircraft in an open, unrestricted, stable market environment with a reasonable balance of supply and demand, and assumes full consideration of its "highest and best use." An aircraft's **Base Value** is founded in the historical trend of values and in the projection of value trends and presumes an arm's-length, cash transaction between willing, able and knowledgeable parties, acting prudently, with an absence of duress and with a reasonable period of time available for marketing. In most cases, the **Base Value** of an aircraft assumes its physical condition is average for an aircraft of its type and age, and its maintenance time status is at mid-life, mid-time (or benefiting from an above-average maintenance status if it is new or nearly new, as the case may be).

Comment: Since **Base Value** pertains to a somewhat idealized aircraft and market combination it may not necessarily reflect the actual value of the aircraft in question, but is a nominal starting value to which adjustments may be applied to determine an actual value. Because it is related to long-term market trends, the **Base Value** definition is commonly applied to analyses of historical values and projections of residual values. In certain appraisal assignments, the appraiser may deem it more appropriate to determine an aircraft's value using alternative methodologies such as those relating to discounted rental streams, projected future profits, or, recognizing the possibilities of unusual aircraft of indeterminate value being swapped or exchanged for other aircraft or assets whose value can be more readily determined and assigned to the unusual aircraft. If he uses the term **Base Value** in the context of such an analysis, he should use it in such a way as to preclude any misunderstanding of the meaning ascribed to the term.

Market Value (or **Current Market Value** if the value pertains to the time of the analysis) is the Appraiser's opinion of the *most likely trading price* that may be generated for an aircraft under the market circumstances that are perceived to exist at the time in question. **Market Value** assumes that the aircraft is valued for its highest, best use, that the parties to the hypothetical sale transaction are willing, able, prudent and knowledgeable, and under no unusual pressure for a prompt sale, and that the transaction would be negotiated in an open and unrestricted market on an arm's-length basis, for cash or equivalent consideration, and given an adequate amount of time for effective exposure to prospective buyers.

Comment: The **Market Value** of a specific aircraft will tend to be somewhat consistent with its **Base Value** in a stable market environment, but where a reasonable equilibrium between supply and demand does not exist, trading prices, and therefore **Market Values**, are likely to be at variance with the **Base Value** of that aircraft. **Market Value** may be based upon both the actual (or specified) physical condition and maintenance time status of the aircraft, or alternatively upon an assumed average physical condition and mid-life, mid-time maintenance time status, depending on the nature of the appraisal assignment. The actual basis for the aircraft's technical status used in determining the value should be set forth in the Appraiser's report.

Fair Market Value is synonymous with **Market Value**, and likewise **Current Fair Market Value** is synonymous with **Current Market Value** because the criteria typically used in those documents that use the term "Fair" reflect the same criteria set forth in the above definition of **Market Value**.

Comment: By itself, the term "Fair" does not bring any additional qualifications to the appraised value, but it is a term sometimes used in leases, sales contracts, tax regulations and legal documents, and is sometimes accompanied with a specific definition to which the contracting parties have agreed. In such cases an appraiser may be required to determine his value according to that particular definition, which should be delineated in the appraisal report.

Residual Value is the value of an aircraft, engine or other item at a future date, often used in connection with the conclusion of a lease term.

Distress Value, Forced Sale Value, Liquidation Value are terms to describe the Appraiser's opinion of the price at which an aircraft (or other assets such as an engine or spare parts) could be sold in a cash transaction under abnormal conditions – typically an artificially limited marketing time period, the perception of the seller being under duress to sell, an auction, a liquidation, commercial restrictions, legal complications, or other such factors that materially reduce the bargaining leverage of the seller and give prospective buyers a significant advantage that can translate into heavily discounted actual trading prices. Depending on the nature of the assignment, the appraiser may be asked to qualify his opinion in terms of disposition within a specified time period, for example 60 days, 90 days or six months as the needs may be. Apart from the fact that the seller is uncommonly motivated, the parties to the transaction are otherwise assumed to be willing, able, prudent and knowledgeable, and negotiating at arm's-length, normally under the market conditions that are perceived to exist at the time, not an idealized balanced market.

Comment: In determining its value, it is incumbent upon the appraiser to state clearly in the report the value definition employed, as well as the disposition time period used.. The appraiser must recognize that such transactions are considerably removed from the ISTAT definitions of base and current market value; are apt to be significantly more variable, and in some cases, the appraiser may be asked for an opinion of a value of multiple assets disposed of in one transaction. The transaction may also be specified as being other than for cash. Without exception the appraiser must fully describe the definitions and assumptions he has made in the appraisal report. While the **Distress Value** normally implies that the seller is under some duress, there are occasions when buyers, not sellers are under duress or time pressure and, therefore, willing to pay a premium value.

Securitized Value or **Lease-Encumbered Value** is the Appraiser's opinion of the value of an aircraft, under lease, given a specified lease payment stream (rents and term), and estimated future residual value at lease termination, and an appropriate discount rate.

Comment: The **Securitized Value** or **Lease-Encumbered Value** may be more or less than the Appraiser's opinion of **Current Market Value**. Moreover the Appraiser may not be fully aware of the credit risks associated with the parties involved, nor all related factors such as the time-value of money to those parties, provisions of the lease that may pertain to items such as security deposits, purchase options at various dates, term extensions, sub-lease rights, repossession rights, reserve payments and return conditions.

Salvage Value is the actual or estimated selling price of an aircraft, engine or major assembly based on the value of marketable parts and components that could be salvaged for re-use on other aircraft or engines. The value should be determined and stated in such a way to make clear whether it includes adjustment for removal costs. **Salvage Value** is not the same as **Scrap Value** which is defined below.

Comment: Salvage Value (Parting-out Value) becomes applicable when disassembly for parts would most probably result in the highest cash yield for the asset “as-is” as compared to the Market Value of the asset as a whole. For high-value items such as engines and landing gears, the salvage value might be estimated on the basis of the remaining “good time” before the item would require a major inspection or overhaul. While such disassembly for parts may result in the highest cash yield that can be generated in the marketplace, an owner may elect to reinvest in the asset to restore it as a working aircraft, engine or major assembly because the asset has a “value-in-use” to him that exceeds the Salvage Value or Parts Value.

Note: In addition to its meaning as an *appraisal* term above, Salvage Value is also an *accounting* term for the value of an asset when it has been fully depreciated over its book depreciation period. In that context, Salvage Value is not synonymous with Market Value.

Scrap Value is the actual or estimated market value of an aircraft, engine or major assembly based solely on its metal or other recyclable material content with no saleable reusable parts or components remaining. The scrap value is usually expressed as net of removal and disposal costs. In some cases scrap value could be zero if the dismantling and disposal costs are high, as for example hazardous materials or composite assemblies that might be impossible to recycle.

Single-Unit Sale: While not addressed within the various value definitions above, the Appraiser’s report should make it clear that the value opinions either do or do not assume a single-unit transaction wherein the aircraft would be sold by itself, not as part of a wholesale lot or a large portfolio of aircraft that would be sold *en masse* in a transaction where some “volume discount” might typically apply.

**CRITERIA ASSOCIATED WITH PRINCIPAL
TYPES OF APPRAISED VALUES**

Base Value	Market Value	Distress Value
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THE AIRCRAFT

Time status (if not new)	Usually mid-time, mid-life	Usually as found	Usually as found
Physical condition (if not new)	Usually average, considering type and age	Usually as found	Usually as found
Highest, best use valuation	Yes	Yes	Maybe

THE PARTIES

Willing, able, prudent & knowledgeable	Yes	Yes	Yes
Lack of pressure	Yes	Yes	No; seller is usually "motivated"

THE MARKET

Open, unrestricted	Yes	Yes	Yes
State of market balance	Reasonably stable, reasonably balanced	As perceived at the time	As perceived at the time

THE TRANSACTION

Arm's-length	Yes	Yes	Yes
Sale for cash or equivalent	Yes	Yes	Yes
Adequate time for effective exposure on market	Yes	Yes	No
Single-unit sale	Yes	Usually	Maybe

GLOSSARIES OF TERMS

Because of its specialized nature, appraisal practice involves the usage of many technical and financial terms that may not be commonly understood by clients or laymen. The following glossaries are intended to assist the appraiser's own understanding of these terms, as well as assist him when it is necessary for him to explain their meanings to third parties. The glossary is divided into two sections: technical terms and financial terms.

TECHNICAL TERMS

The following definitions are largely derived from other aviation industry publications, including;

Federal Aviation Regulations, particularly Parts 1 and 241

FAA Publication 8300.9, Airworthiness Inspector's Handbook

World Airlines Technical Operations Glossary (WATOG) developed jointly by the Air Transport Association (ATA), International Air Transport Association (IATA) and Aerospace Industries Association (AIA).

In some cases additional explanatory language has been added as clarification or to discuss the item's particular relevance to the aircraft appraisal process.

Note that some of the entries below refer only to the US FAA where it might be more appropriate to add "or other air authority." Also, in many cases the definitions are drawn from or refer to specific Federal Aviation Regulations, although it is possible that these could differ from similar regulations published by the air authorities in other international jurisdictions.

AC, ADVISORY CIRCULAR

A publication of the FAA to inform the aviation public of non-regulatory material of interest. Unless incorporated into a regulation by reference, the contents of an AC are not binding. An AC is issued to provide guidance and information in its designated subject area or to show a method acceptable for complying with a related Federal Aviation Regulation. EASA does not have directly comparable publications.

ACARS, AIRCRAFT COMMUNICATIONS ADDRESSING AND REPORTING SYSTEM

A communications system that automatically reports via radio when an aircraft is out of the gate, off the ground, back on the ground, and at the gate again, thus automatically collecting data on flight cycles, flight time and block time. During flight the system may also monitor and report on aircraft and engine performance.

ACCIDENT

An occurrence associated with the operation of an aircraft which takes place between the times any person boards the aircraft with the intention of flight and all such persons have disembarked, in which:

- Any person suffers death or serious injury as a result of being in or upon the aircraft, or by direct contact with the aircraft or anything attached thereto; or
- The aircraft received substantial damage; or
- Any damage is caused to the property of a third party.

AD, AIRWORTHINESS DIRECTIVE

A mandatory order issued by the FAA, EASA, or any other National Aviation Authority usually applying to specific types of aircraft, engines or appliances, when an unsafe condition exists and that condition is likely to exist or develop in other aircraft, engines or appliances of the same design. An AD usually requires some maintenance action (possibly only an inspection), within some specified time in order to ensure continued safety and airworthiness, and no aircraft may be operated in contravention of the requirements or limitations of an AD.

All Large Aircraft registered in an EASA Member State are required to only comply against those Airworthiness Directives issued by EASA. The Agency will, unless extenuating circumstances

apply, normally elect to re-issue those Non-EU Member State (Foreign State of Design) ADs automatically unless it has already issued its own AD on the same subject, in which case different compliance data may apply.

ADF, AUTOMATIC DIRECTION FINDER

A radio navigation system that receives a signal from a ground Non-Directional Beacon (see NDB) and displayed on the pilot's ADF indicator. The needle on the indicator points towards the selected station, thus giving the pilot the bearing to the station relative to the aircraft's heading.

AIRCRAFT

A device that is used or intended to be used for flight in the air.

AIRCRAFT, LARGE

A defined category used by the US FAA for aircraft having a maximum certificated takeoff weight more than 12,500 pounds. EASA uses the same term for aircraft with maximum takeoff weight equal or more than 5,700 kg (about 12,565 lbs).

AIRCRAFT, SMALL

A defined category used by the US FAA for aircraft having a maximum certificated takeoff weight of 12,500 pounds or less. EASA uses the same term for aircraft with maximum takeoff weight below 5,700 kg (about 12,565 lbs).

AIRPLANE

An engine-driven fixed-wing aircraft, heavier than air, which is supported in flight by the dynamic reaction of the air against its wings.

AIRWORTHINESS

The condition of an item (aircraft, aircraft system or part) in which that item is capable of operating in a safe manner to accomplish its intended purpose. Two key factors are: the aircraft (or device) must conform to its type design and it must be in a condition for safe operation.

AIRWORTHINESS CERTIFICATE

An Airworthiness Certificate is issued by the FAA for an individual aircraft when it is satisfied that the aircraft conforms to the Type Certificate and is in a condition for safe operation. The Airworthiness Certificate is issued to the registered owner, and is transferred with the aircraft. It remains in effect as long as the aircraft is maintained (or altered) according to the appropriate FAA regulations and continues to be registered in the United States. (See FAR 21).

An Airworthiness Certificate is issued by the Aviation Authority of an EASA Member State when it is satisfied that it conforms to the Type Certificate and is in a condition for safe operation. The non-expiring Airworthiness Certificate is only valid for as long as the Airworthiness Review Certificate (ARC) is in force. The validity of the ARC is 12 months and may be issued by the operator of the Aircraft, if appropriately approved, or the incumbent national air authority (NAA). It is mandatory for the original C of A and the ARC to be carried within the Aircraft at all times.

AMM, AIRCRAFT MAINTENANCE MANUAL

A manual that describes the methods, techniques and practices to be used by persons performing maintenance, alteration or preventive maintenance on an aircraft (see FAR 43.13).

ASSEMBLY

A number of parts, subassemblies, or any combination thereof joined together to perform a specific function and which can be disassembled without destruction of designed use. (The distinction between an assembly and a subassembly is not always exact. An assembly in one instance may be a subassembly in another where it forms a portion of an assembly.)

BURDEN, MAINTENANCE (sometimes also referred to as indirect maintenance cost)

Those maintenance labor and material costs not considered to be direct maintenance costs, but which contribute to overall maintenance program costs through overhead operations, administration, record-keeping, scheduling, controlling, planning, supervision, tooling, test equipment, facilities, etc.

CARGO

All traffic other than passengers. Cargo includes freight, mail and excess baggage shipments.

COMPONENT

Any self-contained part, combination of parts, sub-assemblies or units, which perform a distinctive function necessary to the operation of a system.

COST, DIRECT AND INDIRECT

Although there is not an “official” definition from any regulatory body, aircraft direct operating costs (DOCs) is customarily categorized as follows:

- Flying Operations
- Crew Salaries & Expenses
- Fuel & Oil
- Insurance
- Maintenance
- Direct Labor & Materials
- Maintenance Burden
- Depreciation & Rentals
- Landing Fees & Airport Handling Charges (sometimes)

The major categories of indirect operating costs include:

- Aircraft Servicing
- Traffic Servicing
- Servicing Administration
- Reservations & Sales
- Advertising & Publicity
- General & Administrative.

CVR, COCKPIT VOICE RECORDER

A unit that records pilot’s conversation and cockpit background noise for a minimum of 30 minutes onto an endless loop of magnetic tape or digital media, and is primarily intended to be used by accident investigators. The CVR unit is crash-proof and normally equipped with an independent radio transmitter.

CYCLE, AIRCRAFT OPERATING

A complete flight sequence including taxi, takeoff, flight en route, and landing. In the case of engines, a cycle includes starting, acceleration to maximum rated power, deceleration and stopping (FAR 33.14).

DER, DESIGNATED ENGINEERING REPRESENTATIVE

A DER is a person approved by the FAA to certify specific repairs or modifications to specific systems as covered under his/her capability authorization. There is no directly comparable designation within EASA.

DER Repair – Approval from the FAA via a Designated Engineering Representative of the engineering data relating to the modification or repair of a system or component on an FAA-registered aircraft. The approval basis may be based on acceptable and or approved data provided by the operator or the OEM, depending upon the scope of approval sought.

EASA

The European Aviation Safety Agency. EASA is responsible for regulating aviation in all the EASA member countries. The organization is headquartered in Cologne, Germany.

EASA Part 145 Approval – An approval bestowed upon a maintenance company authorizing the completion of maintenance, repairs and modifications to EASA member registered Aircraft to a certain level, as defined within its capability listing.

ECMP, ENGINE CONDITION MONITORING PROGRAM

A program permitting the non-invasive monitoring of various engine parameters on a repetitive basis in order to analyse the performance of the engine while in flight. Among many parameters typically recorded are N1 & N2 speed, fuel flow, vibration and EGT. Data is typically analysed using propriety software issued by the engine manufacturer which permits the setting of various 'alert levels' and defect resolution guide.

EDTO, EXTENDED DIVERSION TIME OPERATIONS

ICAO's term for ETOPS. See the entry for ETOPS in this glossary.

EFIS, ELECTRONIC FLIGHT INSTRUMENTS SYSTEM

A system that replaces the conventional electro/mechanical cockpit gauges with computerized cathode tubes or liquid crystal displays combining a number of gauges. Multiple pages can be accessed for navigation and aircraft system information.

EGPWS, ENHANCED GROUND PROXIMITY WARNING SYSTEM

See GPWS.

EGT, EXHAUST GAS TEMPERATURE

The temperature of the exhaust gasses in a turbine engine.

EGT Margin

In a turbine engine, the difference between the EGT limit (or EGT red line) and the engine's actual EGT when producing maximum thrust at the full rated take-off power setting. The actual EGT should be lower than the EGT limit, and the magnitude of this difference (the EGT margin) is indicative of the time remaining before normal deterioration of the engine will require removal for restoration.

EMPG, ENGINE MAINTENANCE PLANNING GUIDE

The EMPG is issued and revised by the Engine Manufacturer and is based on the principle of on-condition maintenance, relying on extensive visual/dimensional build group and piece part inspections and a soft time policy on particular build groups and components. The objective of the guide is to achieve a cost effective method to achieve optimum levels of engine performance and reliability.

ENGINE

The basic engine assembly plus its essential accessories as supplied by the engine manufacturer. These include those units and components which are used to induce and convert fuel/air mixture into thrust/power; to transmit power to the propeller shaft, if any, and accessory drives; to supplement the function of other defined systems external to the engine; and to control and direct

the flow of internal lubrication. The nacelle and the reverser are excluded. See also definition of QEC.

ENGINE PERFORMANCE RESTORATION, PR

The services performed during an Engine Shop visit in which, at a minimum, the compressor, combustor and high-pressure turbine are exposed and subsequently refurbished. For those refurbished modules the time and cycles since PR are then re-set to zero.

ENGINE SHOP VISIT

An engine removal is classified as a "shop visit" whenever the subsequent engine maintenance performed prior to reinstallation entails one of the following:

- Separation of pairs of major mating engine flanges (other than solely for shipment),
- Removal/replacement of a disk, hub, or spool.

Sometimes the definition is specifically tailored, as in some Airworthiness Directives that say, "For the purpose of this AD, an engine shop visit is defined as input to an engine repair shop where the low pressure turbine module is removed" ... or "the front and rear flanges of the combustion case are separated" ... or "any major module is separated" ... or "the inlet gearbox is exposed."

ENGINE TABLE INSPECTION

A Table Inspection may be made by the owner/operator of the engine immediately after an engine has been disassembled, and prior to any cleaning. The intent of the table inspection is to detect potential or probable mechanical discrepancies with the internal hardware and permit the maintenance provider and engine owner/lessor to decide upon the final workscope. The results of this inspection may warrant a change to the initial workscope.

EROPS, EXTENDED-RANGE OPERATIONS

Generally, flight operations at a distance more than 60 minutes flying time with one engine inoperative from a suitable airport. "EROPS" now has virtually no official standing except within Canada where certain communication, navigation and emergency requirements pertain to all aircraft in extended-range operations, regardless of the number of engines. In the U.S. and many other countries, the requirements have evolved into "ETOPS" (listed separately below) with rules that apply only to twin-engine aircraft operating beyond the 60-minute distance.

ETOPS, EXTENDED OPERATIONS (Formerly Extended-Range Twin-Engine Operations)

A brief history: As aviation technology evolved, regulations also evolved to address the safety of commercial aircraft operations in areas remote from airports where an aircraft in distress could make an immediate emergency landing. In the US, the first rule-making was in 1936, with updates in 1953, 1961, 1985 and 1988 with rules regarding two-engine aircraft and specified time and/or distance limits from suitable diversion airports. The 1985 rules introduced the acronym "ETOPS" (Extended-Range Twin-Engine Operations), allowing two-engine aircraft to operate on routes up to 120 minutes from an adequate airport after demonstration of specific levels of in-service experience and systems reliability. Over time, additional standards were established for longer diversion times of 138 minutes (an increase of 15% over the 120-minute rule), 180 minutes, and 207 minutes (15% beyond 180 minutes).

Some of the rules aimed at two-engine aircraft have been extended to three- and four-engine aircraft on the basis that all long-range passenger-carrying aircraft, regardless of the number of engines, needed a viable diversion airport in the case of onboard fire, medical emergency, or catastrophic decompression. Nevertheless, the acronym "ETOPS" is still operative, although it is now defined simply as "Extended Operations". Moreover, diversion times up to and beyond 240 minutes may be permitted in certain area-specific or city-pair-specific circumstances.

EASA has similar rules for two-engine aircraft (depending on passenger capacity and maximum takeoff weight) for diversion times of 60 minutes, 90 minutes, 180 minutes and beyond 180 minutes. EAA also uses the acronym "LROPS" for Long Range Operations, that proposes to extend some of the provisions for two-engine aircraft to aircraft with three and four engines.

Note also that there is more to ETOPS than just reliable aircraft and engines. There are operational challenges with limited navigation and communications infrastructure in the north and south polar regions as well as the southern Atlantic and southern Indian Ocean where there may be few suitable diversion airports and where weather reporting and forecasting and field conditions can be problematic. There are other concerns to be addressed, including maintenance, maintenance training, ETOPS-qualification for maintenance persons, engine condition monitoring, oil consumption monitoring, APU starting after cold-soak in flight, dispatch, flight planning and flight monitoring, fuel-freeze risks on long polar flights, protection and recovery of stranded passengers and so on.

References for digging deeper into ETOPS:

FAA Advisory Circular 120-42B "Extended Operations (ETOPS) and Polar Operations" dated 13 June, 2008.

EASA AMC 20-6 rev 2 "Extended Range Operation with Two-Engine Aeroplanes ETOPS Certification and Operation" dated 23 December, 2010.

ICAO Convention on International Civil Aviation, Annex 6 Part I "Operation of Aircraft, International Commercial Air Transport"

EXPENDABLE see Item, Expendable.

EXTENDED OVERWATER OPERATIONS

Flight operations over water at a horizontal distance of more than 50 nautical miles from the nearest shoreline. These are operations for which the regulations require certain communications equipment, as well as various items of emergency and water survival equipment (life rafts and emergency flotation devices, for example). Note that the distance is specified from the shoreline, not necessarily from an airport.

FADEC

The Full Authority Digital Engine Control (FADEC) unit consists of a number of modules which manage the operation of the engine and accessories throughout its operating range. The unit normally consists of one active and standby channel, which then swap over at each engine start. A permanent dedicated alternator powers the unit until aircraft power is available.

FAIL-SAFE

A design criterion which requires that predictable failure of an item will not place the aircraft into an uncontrollable condition. The intent is that a partial failure of a structural element, for example, will not lead to the catastrophic failure of the entire structure.

FDR, FLIGHT DATA RECORDER

A fire and crash resistant black box (painted orange) which records the basic flight dynamics of the aircraft, such as airspeed, "G" loads, acceleration, altitude, attitude and direction. In addition, all of the operations of critical aircraft systems, such as control surfaces, pilot control inputs, engine, hydraulic, electrical systems etc. are recorded. The FDR can usually be located in the tail area of the aircraft and has a location radio transmitter.

FLIGHT

The entire passage consisting of one or more flight legs, from leaving the airport of origin to arrival at the airport of final destination and operated under one flight number.

FMS, FLIGHT MANAGEMENT SYSTEM

The FMS is the general name given to the system, which consists of a number of individual automated avionic systems, relating to the navigation, performance and automation of flight. Control and data input is typically effected through the Central Display Unit (CDU) which also illustrates routings and performance limitations. Data is transferred between the various systems typically using an ARINC 429 data bus.

FLY BY WIRE

The term "Fly by Wire" relates to the transmission of a control input by electrical cabling rather than mechanical controls. In the flight deck, transducers translate the physical displacement of a control input into an electronic signal which is transmitted via various flight control computers to electrically controlled, hydraulically actuated power control units attached to the flight control surface. This type of control system is also used by the powerplant to control thrust through the FADEC unit (Full Authority Digital Engine Control).

FOD, FOREIGN OBJECT DAMAGE

Damage to any portion of the aircraft (most commonly engines) caused by impact or ingestion of birds, stones, hail or other debris.

GPS, GLOBAL POSITIONING SYSTEM

A worldwide radio-navigation system using a constellation of 24 US Department of Defence satellites as reference points enabling the receiver to compute position, velocity and time with very high precision.

GPWS and EGPWS

Ground Proximity Warning System and Enhanced Ground Proximity Warning System. Equipment installed in an aircraft to automatically provide a timely and distinctive warning to the flight crew when the aircraft is in potentially hazardous proximity to the earth's surface. Typically a GPWS is based on downward-looking radar that senses the aircraft's altitude above the ground and the rate of change of that altitude. EGPWS systems typically include forward-looking features and stored mapping databases to give the crew additional warning time and greater awareness of terrain elevations for a wide area around the aircraft.

HOT SECTION INSPECTION (HSI)

The inspection and restoration of the hot section items of an engine (principally the combustion and turbine sections), usually at a predetermined time/cycle limit. A hot section inspection is not necessarily considered an "engine shop visit" (see separate listing) if no major disassembly or repairs are required.

HOURS, BLOCK/FLIGHT See listings under "Time"

ILS, INSTRUMENT LANDING SYSTEM

An electronic system for providing flight path guidance to landing aircraft. Guidance consists of a localizer for lateral guidance and the glide slope for vertical guidance. Range from the touchdown zone is provided by the outer and middle electronic markers. There are several categories of ILS approaches. Most fall into Category 1, with the lowest decision height (DH) in this group set at 200 feet above the touchdown point and a minimum visibility of 1,800 feet runway visual range (RVR). The most severe category, reserved for aircraft and airports with very precise computer controlled guidance systems, is Category 3c with both the minimum DH and RVR set at zero feet.

INSPECTION, DETAILED

An intensive visual examination of a specified detail, assembly, or installation. It searches for evidence of irregularity using adequate lighting and, where necessary, inspection aids such as mirrors, hand lens, etc. Surface cleaning and elaborate access procedures may be required.

INSPECTION, EXTERNAL SURVEILLANCE (STRUCTURAL)

A visual check that will detect obvious unsatisfactory conditions/discrepancies in externally visible structure. It may also include internal structure which is visible through quick opening access panels/doors. Work stands, ladders, etc., may be required to gain proximity.

INSPECTION, GENERAL VISUAL

A collective term which includes the External Surveillance Inspection, the Internal Surveillance Inspection, and the Walk-Around Check.

INSPECTION, INTERNAL SURVEILLANCE (STRUCTURAL)

A visual check that will detect obvious unsatisfactory conditions/discrepancies in internal structure. This type of inspection applies to obscured structure and installations which require removal of fillets, fairing, access panels/doors, floor-boards, liners, insulation blankets etc.

INSPECTION, WALK-AROUND CHECK

A visual check conducted from ground level to detect obvious discrepancies.

ITEM, EXPENDABLE

Items for which no authorized repair procedure exists, and for which cost of repair would normally exceed that of replacement. Expendable items include nuts, bolts, rivets, sheet metal, wire, light bulbs, cable and hose. For financial accounting purposes, expendable items are normally considered to be consumed when they are issued, so they are then not carried as inventory assets.

ITEM, LIFE-LIMITED

An item which, when listed on the aircraft, engine or propeller type certificate data sheet or the manufacturer's instructions for continued airworthiness, must be permanently removed from service and discarded before a specified time (e.g. hours, cycles or calendar limit) is achieved. Among the most significant life-limited items for appraisal purposes are engine disks and shafts.

ITEM, REPAIRABLE

A replaceable part or component, commonly economical to repair, and subject to being rehabilitated to a fully serviceable condition over a period of time less than the life of the flight equipment to which it is related. Examples include many engine blades and vanes, some tires, seats, galleys.

ITEM, ROTABLE

An item that can be economically restored to a serviceable condition and, in the normal course of operations, can be repeatedly rehabilitated to a fully serviceable condition over a period of time approximating the life of the flight equipment to which it is related. Examples include avionics units, landing gears, auxiliary power units, major engine accessories.

ITEM, TIME-LIMITED

An item which must be inspected, tested or reconditioned at specified intervals of time (hours, cycles or calendar) in order to ensure continued airworthiness. Not the same as Item, Life-Limited, listed separately.

JAA

Joint Aviation Authorities, an association of the civil aviation regulatory authorities of European states for the development and implementation of common safety standards and procedures. EASA essentially took over from the JAA in September 2003.

JAR

Joint Aviation Requirements, advisory and regulatory materials promulgated by the Joint Aviation Authorities (JAA) pertaining to matters such as flight crew licensing, maintenance, operations and certification procedures. After EASA took over from JAA in September 2003 JARs were superseded by EASA regulations.

LIFE, ECONOMIC USEFUL

As it pertains to an aircraft or engine, the economic useful life is the period of time over which it is (or is expected to be) physically and economically feasible to operate it in its intended role. Periodic maintenance and repair will usually be required in order to preserve safety and efficiency during the economic useful life.

LROPS, LONG RANGE OPERATIONS

An EASA term for the proposed extension of some provisions of two-engine ETOPS to apply to three-engine and four-engine aircraft. See the ETOPS entry in this glossary.

MAINTENANCE

Those actions required for restoring or maintaining an item in serviceable condition, including servicing, repair, modification, overhaul, inspection, determination of condition, preservation and storage.

MAINTENANCE, CONDITION-MONITORED

A primary maintenance process under which data on the whole population of specified items in service is analyzed to indicate whether condition monitored maintenance allows failures to occur, and relies upon analysis of operating experience information to indicate the need for appropriate action. Some allocation of technical resources is required. Not a preventive maintenance process,

Note - Failure modes of condition-monitored items do not have a direct adverse effect on operating safety.

MAINTENANCE, HARD TIME

A primary maintenance process under which an item must be removed from service at or before a previously specified time in order to perform some required actions such as inspection or refurbishment.

MAINTENANCE, ON-CONDITION

A primary maintenance process having repetitive inspections or tests to determine the condition of units, systems, or portions of structure with regard to continued serviceability. Corrective action is taken when required by the item's condition. For example, a hydraulic component may be tested regularly to determine its internal leakage rate, but refurbishment is required only when the rate exceeds a specified limit.

MAINTENANCE, SCHEDULED

The maintenance performed at defined intervals to retain an item in a serviceable condition by systematic inspection, detection, replacement of worn out items, adjustment, calibration, cleaning, etc.

MEL, MINIMUM EQUIPMENT LIST

An approved list of items which may be inoperative for flight under specified conditions and/or specific limited periods of time. Use of the MEL is authorized by the airline's Operations Specifications.

Regulatory authorities, like the FAA in the US, require certain systems and equipment to be operative for multi-engine aircraft operations. The MEL provides for deviations from these

requirements when the manufacturer or operator has proven that the aircraft may safely operate without certain items, sometimes under certain conditions. For example, a four-engine aircraft with electrical generators on each engine might be safely dispatched if one generator is known to be inoperative, in which case the MEL would state that a minimum of three generators must be serviceable. The standards could be higher for twins in ETOPS operations compared to non-ETOPS operations. The pilot in command is responsible to assure that the missing or inoperative equipment is allowed for in the MEL and noted in the on-board maintenance log book. Depending on the criticality of the component, there may be time limits to operating a commercial aircraft before correcting the problem. The limit can vary from mandatory correction at the next maintenance facility for a navigation/radio component to a week or more for an escape slide provided the door is clearly placarded.

MLW

Maximum landing weight.

MTOW

Maximum take-off weight.

MZFW

Maximum zero fuel weight. Equals the operating empty weight of the aircraft (see OEW, which includes unusable fuel and an allowance for the weight of the crew), plus maximum allowable payload.

MID-TIME, MID-LIFE (sometimes half-time, half-life) These are two terms commonly used by appraisers to describe the maintenance time status of an aircraft or engine.

- Mid-time pertains to scheduled inspections or overhauls that are repeated at specified intervals of time, with “mid-time” (or half-time) implying that the status is mid-way through such an interval.
- Mid-life pertains to items with mandated life limits (engine disks, for example), and “mid-life” (or half-life) implies that such items have been in service for one-half of their life limits.

MSG3 Maintenance Program

A maintenance program developed in accordance with the principles developed jointly by the FAA and Airlines for Air Transport America (ATA) and compiled by the Maintenance Steering Group (MSG). The results of the MSG analysis form the main body of the Maintenance Review Board (MRB) report, which is then certified by FAA or EASA as the minimum acceptable requirements in an operator’s maintenance program. The program is designed around historical and assumed probability of failure rates and takes a top down approach by reviewing the effect of system failures, rather than individual component failures, upon the operation of the Aircraft. The effect of a system failure upon the safety of the Aircraft will determine the type and frequency of each task to be accomplished to each component. The operator is responsible for completing each task at the required interval and it may not necessarily be completed in conjunction with other tasks (as with a block maintenance program). However operators will normally complete those tasks that exhibit a common compliance interval at the same time leading to creation of a check sequence. Revisions to the program, as issued through the Maintenance Planning Document, reflect an annual review of data reflecting changes to component failure rates .The primary advantage of MSG3 is to improve Aircraft availability and reduce costs. For commercial Aircraft EASA and FAA will only now accept proposed maintenance programs based on MSG3 standards.

MTBF, MEAN TIME BETWEEN FAILURES

A reliability performance figure calculated by dividing the total unit time or cycles accrued in a period by the number of unit failures that occurred during the same period.

MTBR, MEAN TIME BETWEEN REMOVALS

A reliability performance figure calculated by dividing the total unit time or cycles accrued in a period by the number of unit removals (scheduled plus unscheduled) that occurred during the same period.

NDB, NON-DIRECTIONAL BEACON

A ground-based radio navigational aid, typically operating on a frequency between 190 kHz and 535 kHz, which may be tuned by the pilot on his ADF (which see). The needle on his ADF indicator points to the station. Formally the primary radio navigation aid before the advent of the VOR system (which see), it is now used mostly to locate an NDB equipped airport during an instrument approach.

NDT, NON-DESTRUCTIVE TESTING

A maintenance procedure to determine the condition of an area or part of an aircraft or component by means of tests that do not affect the function or serviceability of the item being tested. Some commonly used NDT methods include visual, radiographic, magnetic particle, ultra-sonic, dye penetrate, and eddy-current inspections.

OEW

Operating empty weight. (Sometimes called the OWE or operating weight empty). The weight of the aircraft with its normal operating equipment, unusable fuel and an allowance for the weight of the crew. It does not include payload and usable fuel. The aircraft must be weighed in accordance with the approved maintenance program schedule and airworthiness regulations.

OVERHAUL

The disassembly, inspection and/or check of an aircraft, component, engine or appliance to an extent necessary to determine, as substantiated by service experience and accepted practices, that it is in satisfactory condition to operate one complete overhaul period. It shall include the replacement, repair, adjustment or refinishing of such parts as required, which, if improperly accomplished would adversely affect the structural strength, performance, flight characteristics or safety of the aircraft involved. See FAR 43.2 and also "rebuild" defined below.

PARTS POOL

An arrangement whereby participants are entitled to withdraw items from the agreed stock held by any participant.

PITOT-STATIC SYSTEM

On a simple aircraft some of the flight instruments (airspeed indicator, altimeter and vertical speed indicator) are driven by air pressures derived from the passage of the aircraft through the air. These pressures are sensed by the pitot tube and static ports. The pitot tube is an open-ended, forward-facing tube to sense the "ram" air pressure required to operate the airspeed indicator. The static ports are usually small, flush holes on the fuselage sides that sense static pressures for the altimeter and rate of climb indicator. These sensors, indicators and their connecting tubing constitute the pitot-static system.

PMA, PARTS MANUFACTURE APPROVAL

A Parts Manufacturer Approval (PMA) is an FAA design and production approval for aircraft parts. It is only issued after the FAA has (1) reviewed the design of the part to assure that it is safe and meets the requirements of the FAA regulations and (2) reviewed the production quality system to make sure that there is a system in place to verify that each part that is manufactured

meets the FAA-approved design. The operator/owner is ultimately responsible for ensuring the safe operation of the Aircraft upon which PMA parts are installed. There is not a directly comparable approval process in the EASA regulations.

PROGRAM, MAINTENANCE

A program, either acceptable or approved by airworthiness authorities, which defines a logical sequence of maintenance actions to be performed as events or pieces of a whole which, when performed collectively, result in achievement of the desired maintenance standards. The program may be originated by the manufacturer or the operator.

- A “Block Maintenance Program” is one which allocates major structural inspections and/or maintenance tasks into groups, or blocks, which permit convenient, economical and effective accomplishment. A program of recurring C-Checks and D-Checks may be a block maintenance program. See also phased maintenance program below.
- A “Continuous Airworthiness Maintenance Program” is a compilation of the individual maintenance and inspection functions utilized by an operator to fulfill its total maintenance needs (see Advisory Circular AC120-16C and FAA publication 8300.9). The authorization to use continuous maintenance programs is documented in the operator’s Operations Specifications. The basic elements of a continuous airworthiness maintenance program are:

Aircraft inspection
Scheduled maintenance
Unscheduled maintenance
Engine, propeller and appliance repair & overhaul
Structural inspection program / airframe overhaul
Required inspection items
Maintenance manuals

- A “Phased Maintenance Program” (sometimes called an “equalized” or “segmented” program) is one where some of the maintenance effort is apportioned to smaller packages that may be accomplished more frequently than the packages in a block maintenance program. Usually, the objective of this subdivision of effort is to even out the maintenance workload over time and shorten the length of each period of down-time.
- Note that the distinction between “block” and “phased” programs is not very clear. Different airlines and different air authorities have adopted many variations, so these terms do not have unique meanings applicable to all circumstances. For example, the C-Check might be divided into phases while the D-Check is left intact, or the D-Check might also be divided into phases, and the number of phases could be large or small. Moreover, different airlines have adopted different lettering and numbering terminologies to designate their checks.
- A “Progressive Maintenance” program is one which provides for the complete inspection of an aircraft within each 12 calendar months, consistent with the manufacturer's recommendations and other regulatory requirements. In practice, this primarily applies to small aircraft, although FAA Order 8300.9 Section 5 says the progressive inspection system “is particularly adaptable to larger multiengine aircraft and aircraft operated by companies and corporations where high utilization is demanded.” See also FAR 91.409(d).

QEC, QUICK ENGINE CHANGE

A QEC kit is a collection of components and accessories such as pumps, generators, thrust reverser, nose cowl, wiring harnesses and fluid lines installed onto a bare engine to speed the eventual installation of the entire power plant onto an aircraft. See also “Engine.” The actual make-

up of the QEC kit will usually depend on the type of aircraft that the engine will be used on, and may also be different for different engine positions on the same aircraft. With the QEC kit installed, the power plant is sometimes then called a "QEC Unit."

REBUILD

A maintenance process whereby an aircraft, engine, propeller, appliance or component part is disassembled, cleaned, inspected, repaired as necessary, reassembled and tested to the same tolerances and limits as a new item, using either new parts or used parts that either conform to new part tolerances and limits or to approved oversized or undersized dimensions. See FAR 43.2.

REGISTRATION CERTIFICATE

With certain exceptions for foreign aircraft, aircraft with temporary authorizations, or aircraft of the armed forces, no aircraft may be operated without a Registration Certificate that is issued to its owner by the FAA. The Registration Certificate is also the basis for assigning a U.S. identification number ("N-Number"). Generally, the Registration Certificate remains effective until the aircraft is sold, exported, destroyed or scrapped. Note that this definition pertains specifically to the U.S. but comparable regulations apply in most other jurisdictions.

Outside the US, The Aviation Authority of each country is responsible for issuing and cancelling the registration certificate of each Aircraft. The aircraft need not have in force a Certificate of Airworthiness in order to receive a Registration Certificate. If the owner or operator of the Aircraft changes then these details must be amended on the certificate. It is mandatory for this Certificate to be carried in the Aircraft at all times.

REPAIR

The restoration of an airframe, powerplant or appliance to a condition for safe operation after damage or deterioration. A "Major" repair is one that, if improperly done, might appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics or other qualities affecting airworthiness.

REPAIRABLE see Item, Repairable

ROTABLE see Item, Rotable

ROTORCRAFT (sometimes rotocraft)

A heavier-than-air aircraft that depends principally for its support in flight on the lift generated by one or more rotors.

RVSM, REDUCED VERTICAL SEPARATION MINIMUM

A program to reduce the vertical separation between airways above Flight Level 290 (29,000 feet) from the previous 2,000-ft minimum to 1,000-ft minimum in order to increase airspace capacity. An implementation schedule for various regions of the world has been established by ICAO. Both the individual operator and the specific aircraft type require approval before conducting flights in RVSM airspace.

SB, SERVICE BULLETIN

A document issued by the manufacturer to notify the owner or operator of an aircraft (or engine or other device) of recommended (or required by Airworthiness Directives) modifications, substitution of parts, special inspections/checks, reduction of existing life limits or establishment of first-time life limits and conversion from one engine model to another. Service Bulletins may or may not be FAA-approved.

STC, SUPPLEMENTAL TYPE CERTIFICATE

See also Type Certificate. An STC is issued by the FAA to grant approval for an alteration of a product by a major change in the type design, where such a change is not great enough to require a new application for a Type Certificate. The STC is kept by the applicant and is then the basis for issuing or retaining airworthiness certificates to all aircraft (or engines or propellers) subsequently modified in the same way. In the case of alterations by the original manufacturer, approval is normally in the form of an amendment to the original Type Certificate, rather than an STC. (See FAR 21).

For all Aircraft registered to a EASA member state all Supplemental Type Certificates must have received EASA approval confirming applicability and compliance prior to installation. Instructions for Continued Airworthiness (ICAs) must form part of the STC and must, for new commercial Aircraft, conform to MSG3 program requirements. In most cases EASA will accept FAA previously approved STCs but reference to the appropriate regulations is required.

TCAS, TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM

A system intended to alert flight crews of the existence of nearby aircraft and to provide warning of imminent collisions. There are four categories of TCAS; TCAS I is a proximity warning system that advises pilots of the presence of nearby aircraft and is mainly used in General Aviation. TCAS II is intended to warn pilots of an impending collision, and it commands vertical avoidance maneuvers. TCAS III and TCAS IV, both designed to provide horizontal clearance, were never certified, due to accuracy issues. TCAS II Version 7.01 is the proposed future standard and incorporates upgrades permitting reversible resolution advisories. Both the FAA and EASA are expected to make the installation of this system mandatory in both new and used Aircraft by 2015

TIME, BLOCK

Block time is the time from the moment an aircraft first moves for the purpose of flight until the moment it comes to rest at the destination; sometimes called block-to-block time. Push-back time is considered as part of Block Time.

TIME, FLIGHT

Flight time is the duration of the airborne portion of a flight, sometimes called wheels-off to wheels-on time. It is always less than block time (see above). Note that FAR 1 appears to equate Block Time and Flight Time, but this is not generally accepted.

TIME, TOTAL

The operating time that an aircraft, engine or component has accumulated since new. Unless otherwise stated, this is usually total flight time, rather than total block time.

TIME BETWEEN OVERHAULS (TBO)

The maximum time that an item is permitted to operate between overhauls. TBOs are usually expressed in flight hours, cycles, or calendar increments.

TYPE CERTIFICATE

A Type Certificate pertains to aircraft, aircraft engines and propellers. EASA / FAA issues a Type Certificate when the applicant (normally the manufacturer) submits the type design, test reports, and computations and proves to EASA / FAA's satisfaction that the product meets the applicable requirements of the European Commission Regulations / FARs regarding airworthiness, noise and emissions. The Type Certificate is kept at the manufacturer's facility and is the basis for issuing airworthiness certificates to all aircraft (or engines or propellers) subsequently manufactured according to the same type design. (See EASA EC-1702/2003 and FAR 21).

Type Certificates may also be issued for products manufactured in foreign countries with which the United States has an agreement for the acceptance of these products if the country of origin certifies that the product meets airworthiness, noise and emission standards equivalent to the US standards, and the manufacturer submits the appropriate supporting technical data.

TYPE CERTIFICATE DATA SHEET

The Type Certificate Data Sheet is the part of the Type Certificate setting forth the limitations prescribed by the applicable airworthiness regulations and any other limitations and information found necessary for type certification. Type Certificate Data Sheets may be viewed and downloaded from the FAA and EASA websites.

UTILIZATION, AIRCRAFT

The average daily flying hours or block hours for an aircraft or a fleet of aircraft. May also be expressed in hours per year or hours per month.

VOR/DME

VHF Omnidirectional Range with Distance Measuring Equipment. A primary aid to radio navigation. When tuned to a VOR/DME (frequency range 108.00 – 117.95 MHz) the pilot's VOR indicator can indicate the heading to fly along the radial to the station and by using the DME the aircraft's position on the radial. Using a second VOR for triangulation, a course can be flown without having to fly directly to a station.

FINANCIAL TERMS

ACMI LEASE

In an ACMI lease, the lessor (who may be another airline) provides the aircraft, one or more flight crews, maintenance for the aircraft, and insurance (usually hull and third party liability). The lease may set a minimum guaranteed number of block hours per month. Typically an ACMI lease may be for a few months or a few years. See also Wet Lease and Dry Lease below.

APPRAISAL

A formal valuation of property made by a competent authority. See special section in this handbook for discussion of types of appraisals.

ASSET-BASED FINANCE

Secured asset financing, with credit emphasis on the ownership of, or lien on, such assets as accounts receivable, inventory, machinery and equipment.

BALLOON PAYMENT

The final payment, which is substantially larger than the other payments, of an amortized term loan or lease. Less commonly, balloon payments may also occur periodically during a lease term.

BARGAIN PURCHASE OPTION

An option given to the lessee to purchase leased equipment at lease expiry for a price which is significantly lower than the expected fair market value of that equipment at the end of the lease.

CAPITAL LEASE

A lease in the U.S. is classified as a capital lease if it meets any of the following criteria:

- The lease transfers ownership to the lessee at the end of the lease term.
- The lease contains an option to purchase the property at a bargain price.
- The lease term is equal to 75% or more of the estimated economic life of the property (with exceptions for used property that is already near the end of its useful life).
- The present value of minimum lease rental payments is equal to 90% or more of the fair market value of the leased property.

CHAPTER 7

A chapter of the U.S. Bankruptcy Code which provides the rules whereby a debtor or creditor may petition the court for the appointment of a trustee or receiver to supervise the orderly liquidation of a business.

CHAPTER 11

A chapter of the U.S. Bankruptcy Code which provides the rules whereby a debtor is allowed to file for court protection. Such protection enables the debtor to continue its operations while undergoing reorganization. Chapter 11 also allows a creditor to protect its interests.

DISCOUNTED CASH FLOW

A technique for assessing the present value of future payments which takes into account the time value of money.

DRY LEASE

Traditionally in aircraft and marine leasing, an agreement that provides financing only for the equipment itself, and does not extend to personnel, maintenance, fuel and provisioning necessary to operate the craft. Corollary in marine leasing is a bare boat charter. See also "wet lease."

ETC, EQUIPMENT TRUST CERTIFICATE

A debt security issued by a trust and secured by a mortgage, lease, mortgages, or leases, over a single asset or group of assets. ETC's may be split into several tranches (slices with unique levels of seniority and typically unique interest and repayment terms and ratings).

EETC, ENHANCED EQUIPMENT TRUST CERTIFICATE

An EETC (usually referred to as a "double-ETC") provides an additional liquidity reserve (usually supplied by a rated bank) to pay interest for a specified period of time after a default within an ETC (which see above). Like an ETC, an EETC may be split into several tranches.

INVESTMENT TAX CREDIT (ITC)

A provision of the tax code designed to stimulate investment in capital equipment by allowing a percentage of the purchase price to be credited directly against taxes due.

LEVERAGED LEASE

A leveraged lease involves at least three parties: lessor, lessee and a lender. The lessor owns the equipment and will generally provide a portion of the purchase price while borrowing the remainder, usually on a non-recourse basis, from the lender. The lessor thereby enhances his ability to purchase and own the asset using the capital of a third party.

NET LEASE

A lease which provides that all costs in connection with the use of the equipment are paid by the lessee and are not part of the rental, e.g. taxes, insurance and maintenance are paid directly by the lessee. Note that most capital leases, leveraged leases and direct finance leases are net leases.

NON-RECOURSE LOAN

A debt security in which only the equipment used as security is available as remedy to the creditor. The creditor is not able to look through to all of the borrower's assets. See also Recourse Loan below.

OPERATING LEASE

For financial accounting purposes, a lease which does not meet the criteria of a capital lease (see separate entry). Also used generally to describe a short-term lease whereby the user can acquire the use of an asset for a fraction of its useful life. It is not common, but the lessor may pay for maintenance and insurance.

OWNER TRUSTEE

In a leveraged lease, the party who holds title to the equipment for the benefit of the equity participants. The owner trustee issues trust certificates to the equity participants, maintains the register, acts as the agent for such certificates, and makes appropriate filings to perfect and protect the lenders' interest in the collateral.

PTC, PASS THROUGH CERTIFICATE

A security issued by a trust in the asset-backed market representing an undivided interest in a pool of debt securities. A PTC allows the bundling of multiple separate or groups of assets in a single transaction. A PTC may include notes issued in separate leveraged leases.

PURCHASE OPTION

The right to buy leased property at the end of the lease term. In the U.S., if the tax characteristics of a true lease are to be protected, the purchase option may not be at a price less than the asset's fair market value at the time the right is exercised.

RECOURSE LOAN

Unlike a non-recourse loan (which see above), the creditor has a right to all of the borrower's assets not otherwise pledged.

RENEWAL OPTION

A right whereby the lessee may renew a lease for an additional period after the original termination date. The rent for the renewal period is usually set at a lower rate than in the initial period.

TAX LEASE

A single-investor or leveraged lease in which the lessor has satisfied certain Internal Revenue guidelines, retaining the tax benefits (such as investment tax credits and depreciation) associated with ownership. These tax benefits may be passed through to the lessee in the form of lower rental payments. The lease may require special indemnity by the lessee for any of the lessor's benefits lost or subject to recapture.

WET LEASE

An operating lease that provides crew, fuel and maintenance services in addition to the aircraft itself.

HIGHLIGHTS OF REVISION 6

Introduction

Revision 6 replaces Revision 5, dated October 12, 2005. The material differences are as described below.

Section 1, ISTAT Appraisers' Program

Sub-section B, Paragraph 3, item (b) formerly required that Appraiser Emeritus be contingent on the individual remaining a member of ISTAT. This requirement had not been observed in practice, since the three persons with Emeritus designation in the ISTAT directory (Mike Metcalf, Mort Beyer and Bill Bath) are all deceased. The new text states that the Emeritus designation is not contingent upon remaining a member of ISTAT if the member is retired, incapacitated or deceased.

Sub-section B, Paragraph 3, item (e) *Personal Investigation and Sponsorship*

The task of contacting the references provided by an applicant to the program were formerly assigned to the applicant's sponsor. In keeping with actual practice, that task is now noted as being the responsibility of the IBG.

Sub-section D, *Mandatory Continuing Education Program*

This sub-section was formerly titled "Mandatory Recertification Program" however in practice ISTAT does not "recertify" appraisers. However, retaining certification is contingent on the member attending continuing education seminars as now described in this revision. A new paragraph 3 provides a mechanism for a member who, due to extraordinary circumstances, missed more than two successive continuing education sessions and seeks to be reinstated.

Sub-section E, *Applications to Enroll and Advance in the Appraisers' Program*

Several passages in this section formerly referred to only two examinations (Ethics and Technical) for Candidates wishing to advance to Appraiser Grade. The revised text refers to the current four examinations (Ethics, Technical, Appraisal and Finance).

Paragraph 2. Formerly Candidates had to be enrolled in the program for at least 12 months before they could apply for advancement to Appraiser grade. This was to ensure that Candidates had at least some minimum level of participation in ISTAT prior to taking the exams and advancing to Appraiser grade. We now recognize that prospective Candidates have frequently been invited to attend the continuing education sessions prior to applying to enroll in the program. The new language requires the Candidate to have attended at least one annual ISTAT business meeting and continuing education session, or have been enrolled as a Candidate for at least 12 months prior to the examination date.

Paragraphs 4, 5 and 6 clarify the process for obtaining and submitting applications to enroll in the program, to advance in grade, and to take the examinations.

Sub-section F, *Description of Appraisers' Examinations*

This sub-section has been expanded and rewritten to better describe the examination process and to briefly describe the scope of each of the examinations.

Former sub-section G, *Checklist for the Appraiser Certification Application Package.*

This sub-section has been eliminated in favor of the paragraphs 4, 5 and 6 described above in Section E.

Sub-section G, Administrative Director

The duties and responsibilities of the Administrative Director were formerly described in sub-section H. The text in this section has been updated to conform with the duties and responsibilities assigned to the current Administrative Director.

Section 2, International Board of Governors

Within this section of the current handbook there are several inconsistencies in the use of the terms for the ISTAT Appraisers' Program (IAP) and International Board of Governors (IBG). Those have been corrected.

Sub-section C, Election of IBG Chairman, Chairman Elect and Members, and Terms of Office

The current handbook allows that a serving Chairman may be nominated and elected to serve a second consecutive term, but is silent about the possibility of the other appraiser and non-appraiser members serving consecutive terms. Whether or not that was an oversight, we decided not to visit the issue for this update to the handbook.

Section 3. Types of Appraisals

No changes are contemplated for this section.

Section 4, Value Definitions

No material changes are contemplated here. The ISTAT value definitions have become the widely used industry standard, so we need to be cautious about making non-essential changes that might alter the understanding of our value opinions.

One oversight when the value definitions were formulated in the mid-1990s was the concept of a "single-unit sale." In the handbook it is not mentioned in any of the specifically delineated ISTAT definitions of Base Value, Market Value, Residual Value, Distress Value, Securitized Value, Salvage Value or Scrap Value. Presumably it was to be understood that unless otherwise stated in the appraisal report, the value opinions relate to a single-unit sale.

However, to preclude any possible misinterpretation, and rather than embed new single-unit-sale language in every one of those value definitions, this revision to the handbook recommends that appraisers include a short paragraph within the value definition section of their appraisal reports, specifying whether the value opinions do or do not assume a single-unit transaction.

In addition, in the illustrative table at the end of the value definition section of the current handbook, a single-unit sale is said to apply to Base Value and Market Value, and "maybe" applies to Distress Value. This revision says that "yes" applies to Base Value, "usually" applies to Market Value, and "maybe" applies to Distress Value.

Section 5, Glossaries of Terms

While we do intend to update the technical and financial glossaries, the present draft revision of the handbook does not yet include any proposed additions, deletions or corrections.

HIGHLIGHTS OF REVISION 7

Introduction

Revision 7 replaces Revision 6, dated November 19, 2012. The material differences are as described below.

Summary

Revision 7 does not include any changes to the main body of the handbook. It is solely an update and revision affecting the two glossaries: Technical Terms and Financial Terms.

Mainly the focus was on including new terms that have come into wider use since the previous issues of the handbook, plus revisions and updates to some of the existing terms. A specific area has been the inclusion and reference to EASA terms in the Technical Glossary whereas the previous issues had mostly considered FAA terms. This revision points out some of the similarities and differences in the two aviation authorities.

One other specific focus is an updated discussion of ETOPS because the scope of ETOPS has evolved in many aspects beyond its original application to two-engine aircraft, now including some provisions affecting three- and four-engine aircraft, and to specific areas of operation such as polar regions where there are more considerations than simply distances to possible diversion airports.